The U.S. Army Air Forces in World War II

D-Day 1944

Air Power Over the Normandy Beaches and Beyond

Richard P. Hallion
Air Force Historian

Air Force History and Museums Program
1994

June 6, 1944

Operation Overlord, the Normandy invasion—like William the Conqueror's before it or the Inchon landing afterwards—will long be studied as a classic in military planning, logistics, and operations. Overlord depended to a remarkable degree upon the use of air power in virtually all its forms. A half-century ago, aircraft were primitive vehicles of war compared to the modern attackers of the Gulf War era, with their precision weapons, advanced navigational, sensor systems, and communications. Yet, the airplane still had a profound impact upon the success of the invasion. Simply stated, without air power, Normandy would have been impossible.

Planning for Overlord

By D-Day, June 6, 1944, the Allies had been planning for the invasion of Europe for more than two years. In August 1943, the Combined Chiefs of Staff had approved the general tactical plan for the invasion, dubbed Overlord. General Dwight D. Eisenhower, Commander of the European theater since February 1944, would be responsible for carrying off this bold gambit. The Allies' main strategy, in Eisenhower's words, was to

> . . . land amphibious and airborne forces on the Normandy coast between Le Havre and the Cotentin Peninsula and, with the successful establishment of a beachhead with adequate ports, to drive along the lines of the Loire and the Seine rivers into the heart of France, destroying the German strength and freeing France.

The Allies believed that the enemy would resist strongly on the line of the Seine and later on the Somme, but surprisingly, once ground forces had broken through the relatively static lines of the bridgehead at Saint-Lô and inflicted heavy casualties on enemy troops in the Falaise Pocket, Nazi resistance in France disappeared. British and American armies swept east and north in an unimpeded advance which brought them to the German frontier and the defenses of the Siegfried Line.

Air Power: Critical to Success on D-Day

From the beginning Eisenhower and the rest of the combined forces planners recognized that air power would be critical to success of Overlord. Experience had taught planners to avoid facing hostile air power over the battlefront. This meant that the Luftwaffe would have to be destroyed, but not at the price of sacrificing vitally needed air support missions for air superiority ones.

Fortunately, in early 1944 the Luftwaffe was on the skids. By the fall of 1943, Republic P–47 Thunderbolts equipped with long-range "drop" tanks were inflicting heavy losses on German fighters over Occupied Europe and in the German periphery. Then, in December 1943, the North American P–51B Mustang entered service. Featuring superlative handling qualities and aerodynamic design, and powered by a Packard-built Rolls-Royce Merlin engine, the P–51B (and its successors, the P–51C and P–51D) could escort bomber strikes to Berlin and back, thanks in part to a symmetrical wing

section that was thick enough to house a large quantity of fuel and streamlined enough to minimize drag. These two fine aircraft were worthy supplements to the overall Allied strategic bombing effort.

Whatever the bombing campaign may or may not have accomplished in destroying enemy resources, it did contribute directly to the D-Day success. Large bomber formations were aerial magnets that drew up the Luftwaffe to be destroyed by the American fighter force. The omnipresent Thunderbolts and Mustangs (and less frequently P–38 Lightnings) gave the Luftwaffe no respite over Germany, complementing the shorter-legged Spitfires and Hawker Typhoons of the Royal Air Force.

Between January and June 1944—the five months before D-Day—the Luftwaffe was effectively destroyed: 2,262 German fighter pilots died during that time. In May alone, no less than *25 percent* of Germany's total fighter pilot force (which averaged 2,283 at any one time during this period) perished. During Big Week, American air forces targeted the German aircraft industry for special treatment; while production continued, the fighter force took staggering losses. In March 1944, fully *56 percent* of the available German fighters were lost, dipping to 43 percent in April (as the bomber effort switched to Germany's petroleum production), and rising again to just over 50 percent in May, on the eve of Normandy. No wonder, then, that the Luftwaffe could contribute less than a hundred sorties to the defense of Normandy. Months of concentrated air warfare had given the Allies not only air *superiority*, but air *supremacy* as well.

Basically, the Allied air campaign for the invasion of Europe consisted of three phases. First, Allied fighters would attempt to destroy the Luftwaffe. The second phase called for isolating the battlefield by interdicting road and rail networks. And once the invasion began, Allied air forces would concentrate on battlefield interdiction and close air support. The requirements to keep the landing sites secret—particularly the deception to encourage the Germans to devote their greatest attention in the region of the Pas de Calais—complicated the air campaign. Strike planners had to schedule vastly more operations across the sweep of likely landing sites rather than just at the true site of Overlord. For example, rocket-armed Royal Air Force Hawker Typhoon fighter-bombers of the Second Tactical Air Force (2 TAF) attacked two radar installations outside the planned assault area for every one they attacked within it.



Two P-47D Thunderbolts take off on a bomber escort mission.

The "Desert Fox" on the Beaches

Entrusted with the defense of Nazi-occupied Europe from the Allies, Field Marshal Erwin Rommel realized that he faced a most critical challenge. The Panzer and Ju 87 Stuka dive bomber units that he might want to defend the West were, instead, needed for the Eastern Front; and, of course, aircraft like the Stuka simply could not be expected to survive in the face of intensive Allied air and ground defenses. In 1940, France had confronted the specter of defeat at the hands of Nazi Germany. Now the shoe was on the other foot.

The "Desert Fox" emphasized meeting and defeating the invasion forces on the beach. Rommel understood that if the Allies got a toehold on the continent, it would be extremely difficult, probably impossible, to remove them. The field marshal discussed the upcoming invasion frequently with his naval aide, Vice Admiral Friedrich Ruge, and the Allied air threat figured prominently in his thoughts. On one occasion, as Rommel inspected a gun battery on the coast, two British fighters roared overhead. His staff members scattered at the low-level approach, but Rommel defiantly re-

mained standing in plain view. Perhaps the "Desert Fox" was subconsciously attempting to offset, by this theatrical (if foolhardy) gesture, the crushing Allied air advantage that he knew was deployed against the German forces.

On April 27, forty days before the invasion, Admiral Ruge confided in his diary that he found the disparity between the Luftwaffe and the Allied air forces "humiliating." By May 12, he was reporting "massive" air attacks, though troops often exaggerated the amount of actual damage. On the 30th, with "numerous aircraft above us, none of them German," Ruge narrowly missed being bombed into the Seine by a raid that dropped the bridge at Gaillon. At 0135 on June 6, as Ruge and other senior staff officers regaled themselves with tales of the Kaiser's army and real and imagined conditions around the world, the German Seventh Army reported Allied parachutists landing on the Cotentin peninsula. Overlord was underway. Time had run out for Rommel, and the countdown to the ignominy of the bunker in Berlin had begun.

Assembling the Allied Tactical Air Forces

As Overlord embarked upon its preparatory phase, tactical air power increasingly came into play. Two great tactical air forces existed to support the ground forces in the invasion—the AAF's Ninth Air Force and the RAF's Second Tactical Air Force. Both were under the overall command of Royal Air Force Air Chief Marshal Sir Trafford Leigh-Mallory. In addition, of course, Eisenhower and his ground commanders could call upon strategic aviation as required, in the form of the AAF's Eighth Air Force and Great Britain's Bomber Command.

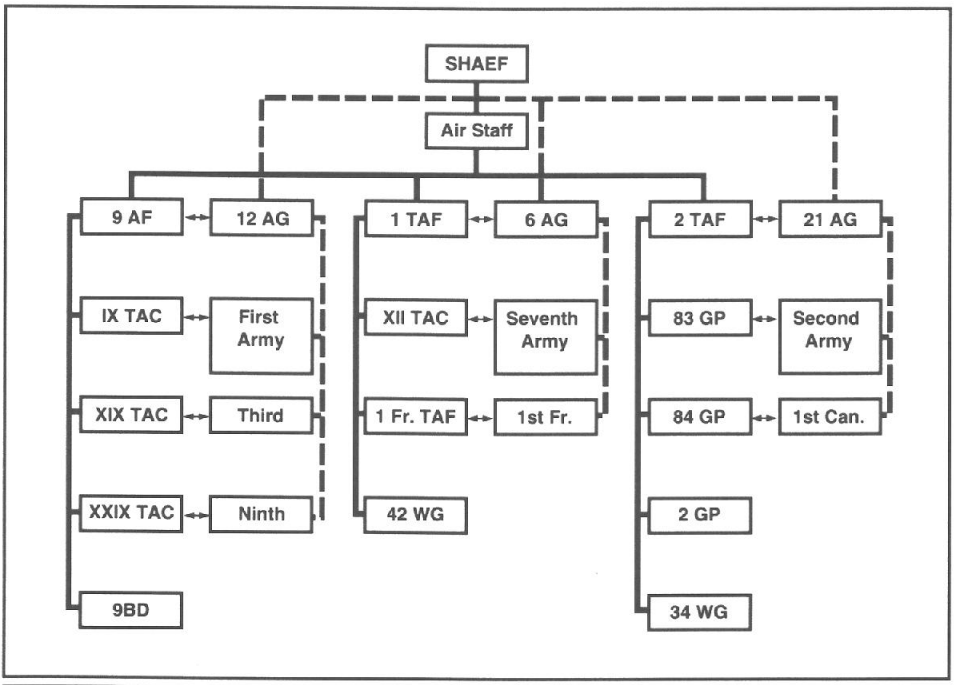
In June 1944 the Ninth Air Force consisted of several commands, including the IX Fighter Command. The IX Fighter Command in turn spawned two Tactical Air Commands, the IX TAC and the XIX TAC. IX TAC had three fighter wings, and the XIX TAC had two. Each of these fighter wings contained at least three—and usually four—fighter groups, a group typically consisting of three fighter squadrons. Of the two, IX TAC was the "heavy"; it could muster no less than eleven fighter groups, while the XIX TAC could muster seven. From late 1943 to early 1944, IX Fighter Command had served primarily as a training headquarters, under the command of Brig. Gen. Elwood Quesada. Eventually Quesada assumed command of the IX TAC, and Brig. Gen. Otto P. "Opie" Weyland took

over XIX TAC. No in-theater formalized structure linked the Ninth and its subordinate commands directly to specific land forces units, though there was a general understanding that the IX TAC would support the First Army, and the XIX TAC would support Lt. Gen. George Patton's Third Army once the Third became operational in France nearly two months after D-Day. Eventually, on August 1, 1944, when both Patton's Third Army and Bradley's 12th Army Group became operational, this arrangement was formalized.

On the British side, the RAF's Second Tactical Air Force (2 TAF) had grown out of initiatives in mid-1943 to structure a "Composite Group" to support the invasion of Europe. It had risen from the ashes of the moribund and never-satisfactory Army Co-operation Command. In January 1944, Air Marshal Sir Arthur Coningham took command of 2 TAF, and two months later he assumed additional duties as commander of the Advanced Allied Expeditionary Air Force (AAEAF). Ironically, at this critical point, two serious command problems arose. Relationships among the RAF commanders, particularly Coningham, Leigh-Mallory, and Arthur Tedder (Deputy Supreme Commander for Overlord) were strained at best. Much more serious was the breakdown between the RAF commanders and 21st Army Group Commander, Field Marshal Sir Bernard L. Montgomery, who also wore an additional hat as commander of Allied ground forces during the invasion.

While fighting Rommel in the Western desert, Montgomery had enthusiastically supported air action in the Mediterranean and accepted whole-heartedly Coningham's thoughts on air support. Ironically, Montgomery and the RAF now came to disagree over the relationship between the air and the land commander. Montgomery paid lip service to the concept of independent air action, but his actions in early 1944 clearly indicate that he considered his equals in the RAF merely advisers. For their part, Coningham and Tedder nursed grudges going back to the plodding advance after second El Alamein and Montgomery's notorious slowness during the pursuit of Rommel's retreating forces.

For the airmen, the critical question in Overlord was how rapidly Montgomery would advance to seize airfields so Allied tactical air forces would not have to operate across the Channel, from bases in England. In fact, this issue turned out to be far less important than originally thought. Bases were quickly hacked out of the Normandy terrain, often only a few thousand yards from opposing German forces. Montgomery's planned advance from the beachhead (which the airmen considered too slow) turned out to be



Abbreviations and Symbols

AF	Air Force
TAC	Tactical Air Command
TAF	Tactical Air Force
BD	Bombardment Group
AG	Army Group
Fr	French
Can	Canadian
GP	Group (RAF)
WG	Wing (RAF)
SHAEF	Supreme Headquarters Allied Expeditionary Force

↔ Liason and Coordination
Air Chain of Command
Land Chain of Command

instead over-optimistic; the actual advance was even slower. Given this, Allied air power in Normandy proved all important. As historian John Terraine has noted:

> History insists that the last word, in regard to the Battle of Normandy, must be that the quarrels did not, finally, matter: Allied air power was so overwhelming that the defeat of Allied intentions on the ground never threatened disaster, only delay, and that only in the early stages, well compensated later. But let us be quite clear about it: what made the ultimate victory possible was crushing air power.

Britain's 2 TAF consisted of four RAF Groups: No. 2 Group, No. 83 Group, No. 84 Group, and No. 85 Group. Of these four, only the first three were really available for the air-land battle in Normandy; 85 Group was under the temporary operational control of No. 11 Group, attached to an RAF home defense command. No. 2 Group consisted of four wings of Boston, Mitchell, and Mosquito light and medium bombers. No. 83 Group, exclusive of a reconnaissance wing and some light aircraft used for artillery spotting, contained one Mustang wing, four Spitfire wings, and four Typhoon wings. No. 84 Group, again exclusive of recce and spotting aircraft, consisted of one Mustang wing, five Spitfire wings, and three Typhoon wings. As the campaign progressed, 2 TAF's subordinate units directly supported units of the 21st Army Group. Thus, the British Second Army could rely upon 83 Group, and 84 Group supported the First Canadian Army.

Another important relationship, however, evolved between the Ninth Air Force's IX TAC and the 2 TAF's 83 Group. IX TAC's Elwood Quesada and 83 Group's commander, Air Vice Marshal Harry Broadhurst, worked well together. For example, after troops were ashore at Normandy, control of tactical aircraft passed from shipboard control centers to two land-based control centers: a IX TAC control center in the American sector of the beachhead, and an 83 Group control center located in the British sector. Coningham later praised the "excellent teamwork" between the two control centers. This teamwork would be refined even further in the weeks ahead.

Altogether, the tactical air forces had 2,434 fighters and fighter-bombers, together with approximately 700 light and medium bombers available for the Normandy campaign. This force first struck against the Germans during the preparatory campaign prior to D-Day. At D minus 60 days, Allied air forces began their interdiction attacks against rail centers; these attacks increased in ferocity and tempo up to the eve of the invasion itself and were

accompanied by strategic bomber raids against the same targets. The bridge campaign, which aimed at isolating the battlefield by cutting Seine bridges below Paris and Loire bridges below Orleans, began on D minus 46. Here, fighter-bombers proved more efficient than medium or heavy bombers, largely because their agility enabled them to make pinpoint attacks in a way that the larger bombers, committed to horizontal bombing runs, could not. The fighter-bombers also had the speed, firepower, and maneuverability to evade or even dominate the Luftwaffe. Though ground fire and (rarely) fighters did claim some attacking fighter-bombers, the loss rate was considerably less than it would have been with conventional attack or dive bombers. By D minus 21, Allied air forces were attacking German airfields within a radius of 130 miles of the battle area and these operations too continued up to the assault on the beachhead.

Air Support on the Beaches

During the June 6 D-Day assault itself, a total of *171 squadrons* of British and AAF fighters undertook a variety of tasks in support of the invasion. Fifteen squadrons provided shipping cover, fifty-four provided beach cover, thirty-three undertook bomber escort and offensive fighter sweeps, thirty-three struck at targets inland from the landing area, and thirty-six provided direct air support to invading forces. The Luftwaffe's appearance was so minuscule that Allied counterair measures against the few German aircraft that did appear are not worth mentioning.

Of far greater importance was the role of aircraft in supporting the land battle. As troops came ashore at Normandy, they made an unpleasant discovery all too familiar to the Marine Corps and Army operating in the Pacific campaign. Despite the intensive air and naval bombardment of coastal defenses, those defenses were, by and large, intact when the invasion force "hit the beach." This was particularly true at Omaha beach, where American forces suffered serious casualties and critical delays. Despite a massive series of attacks by Eighth Air Force B–17s, B–24s and medium bombers in the early hours of June 6, the invading troops were hung up on the beach. The air commanders themselves had, in fact, predicted that the air and naval bombardments would not achieve the desired degree of destruction of German defensive positions. The Army's general optimism that air would cleanse the beaches before its

approach, however, was shattered. Only the subsequent success of fighter-bombers operating against the battlefield would revive the Army's confidence in air support. Indeed, throughout the post-Normandy campaign—and in the Second World War as a whole—the fighter-bomber proved overwhelmingly more valuable in supporting and attacking ground forces in the battle area than did the heavy or even the medium bomber.

Radar Adapted to the Battlefield

Drawing upon experience ranging from the Western Desert and Tunisia through the Sicilian and Italian campaigns, Allied tactical air control in Normandy and during the subsequent European campaign was generally excellent. Fundamental to this success was the wartime evolution of radar. The Allied air forces had radar available to them from the very first day of Normandy operations, and it was soon incorporated into tactical air control as well as for early warning and air defense purposes. Radar had first been used for tactical air support control during the Sicilian and Italian campaigns, and now, in Normandy and the subsequent breakout, it reached new levels of refinement. Each TAC had a radar control group built around a Tactical Control Center (also called a Fighter Control Center), a microwave early warning radar (dubbed a MEW), three Forward Director Posts, three or four SCR–584 Close Control Units (the SCR–584 being a particularly fine precision radar used for positioning data and antiaircraft gun laying), and, finally four Direction Finding stations, dubbed Fixer stations. The MEW, considered the heart of the system, would be located within ten to thirty miles of the front.

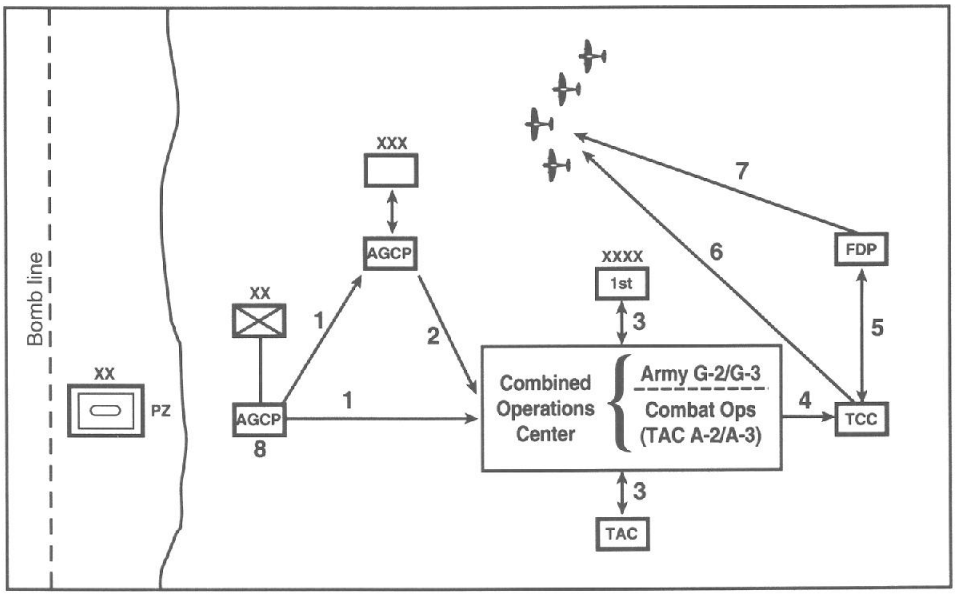
Originally developed for air defense purposes, this radar network now took on added importance for the control of tactical air strikes. For example, when an Air-Ground Coordination Party sent in a request for immediate air support, that request went directly to a Combined Operations Center functioning between the TAC and the Army. There, the Army G–2 and G–3 and the TAC A–2 and A–3 evaluated the request. Assuming it was considered legitimate, the Army G–3 and Air A–3 would each approve it, and the Air A–3 would relay it to the Tactical Control Center with a recommended course of action. Typically, the TCC would relay the request to airborne fighter-bombers, and a geographically appropriate Forward Director Post would furnish precise radar guidance and

navigation information from the MEW and SCR–584 radars to the strike flight, vectoring them to the target area. Once in the target area, of course, the strike flight leader would communicate with the Air-Ground Coordination Party that had sent in the request for final details. For its part, the Air-Ground Coordination Party would arrange for artillery to mark the target with colored smoke and also, if possible, to undertake suppressive artillery fire against known enemy antiaircraft defenses. Radar was also used for so-called blind bombing in conditions of reduced visibility. SCR–584 control eventually enabled blind bombing strikes with accuracies on the order of 400 yards from the predetermined aiming point, notably during the Battle of the Bulge in winter 1944–45.

The Air–Armor Partnership

Normandy's most noteworthy tactical air support development, however, was the close partnership between air and armored forces, typified by the "armored column cover" missions perfected by the IX TAC under Quesada. During the Italian campaign, the British had begun operating so-called contact cars that served as mobile air-ground control posts with armored forces. Now, at Normandy, 83 Group under Broadhurst placed "contact cars" with leading British armored forces so that tactical air units would always know the precise location of friendly and enemy forces. The contact cars functioned in close cooperation with tactical reconnaissance aircraft, reducing the time necessary to set up immediate support strikes. This scheme proved its value particularly during the German retreat out of the Falaise Pocket.

Quesada developed a similar system for the American forces in Normandy—an outgrowth of his commitment to the Army's mission and his relationship with Omar Bradley, then commander of the First Army. Bradley admired Quesada's willingness to regard air support "as a vast new frontier waiting to be explored." Because of this, these two strong-willed commanders got along exceptionally well and felt confident enough to express frank opinions. Shortly before the Saint-Lô breakout, Quesada became convinced that Bradley was reluctant to concentrate his armored forces because of the magnitude of German defensive forces along the front. So Quesada made a deal: if Bradley would concentrate his armor, IX TAC would furnish an aviator and an aircraft radio for the lead tank so that it could communicate with fighter-bombers that Quesada



IX Tactical Air Command Immediate Support System, Summer-Fall 1944

1. Division Air-Ground Coordination Party (AGCP), staffed by Tactical Air Party Officer (TAPO) and Division G-3 (Air), send direct support request to Army G-3 at Combined Operations Center (COC), also informing Corps G-3 (Air) so Corps AGCP can monitor or intervene as necessary.

2. Corps AGCP monitors communications net.

3. COC, consisting of Army G-2 and G-3 together with Tactical Air Command's A-2 and A-3 (termed Combat Operations), consults with Army HQ and TAC HQ on request; then G-3 and A-3 each approve it.

4. A-3 at Combat Ops relays support request and recommended course of action to Tactical Conrol Center (TCC), also termed Fighter Control Center.

5. Forward Director Post (FDP), in constant communication with TCC, provides continuous updates on location of friendly and enemy air units using microwave early warning (MEW) radar tracking.

6. TCC relays strike request to airborne "on call" fighter-bombers.

7. FDP, using SCR-584 radar, furnishes precise guidance and navigation information to en route strike flight.

8. Division AGCP prepares for incoming strike flight by artillery fire to mark targets with colored smoke and to suppress enemy air defenses; AGCP will maintain communication with strike flight during attack.

would have operating over the column from dawn until dark. Bradley immediately agreed, and a pair of M4 Sherman tanks duly arrived at IX TAC headquarters in Normandy (only a hedgerow away from Bradley's own command post) for trial modification. The modification worked and became a standard element of First Army—and subsequently 12th Army Group as a whole—operations.

By the end of July 1944, Quesada's armored column cover operations were receiving enthusiastic support from armor and air forces personnel alike. The 2d Armored Division, for example, had three air support parties: one with the division commander, and one with each of its two Combat Commands. Combat Command A (CCA) found the system particularly useful; their air liaison officer (from the armored forces) rode in a Sherman tank whose crew was entirely AAF except for the tank commander. The tank commander could communicate with his fellow tankers via a SCR–528 radio, while the air liaison officer had a SCR–522 to communicate with the column cover flight. Column cover consisted of four P–47s relieved by another flight every thirty minutes. CCA's liaison officer reported:

> The planes worked quite close to us, generally with excellent results . . . .
>
> Our best air (reconnaissance) information came from the column cover. On occasions G–2 asked me for specific information, and I asked the planes to get it. In most cases the pilots furnished information to me without request, especially that of enemy motor movements. Before leaving,the flight leader would report to me on likely prospective targets, and I would pass the information on to the incoming flight commander.
>
> On one occasion we made an unexpected move for which no air cover had been provided. Information was received of a group of hostile tanks in some woods three or four miles away. I called direct to a plane operating in the zone of another corps and asked him to relay a request to fighter control center for some fighters. Within 15 minutes about 12 planes reported in to me. I located my tank for the plane commander by telling him of the yellow panel [used for identification of friendly forces, and located on the back deck of the tank], then vectored him on to the woods where the enemy was reported. When he seemed to be over the target, I told him to circle and check the woods under him. He located the tanks, and they were attacked successfully.

In a study done immediately after the war for the United States Strategic Bombing Survey, the Air Effects Committee of the 12th Army Group (a committee composed entirely of ground officers, and thus free of the kinds of built-in bias that might have afflicted a committee composed of AAF personnel) assessed the role of

tactical air power in the European campaign. They examined a number of issues, generating a report (which Bradley signed) that endorsed the air support system the AAF employed in assistance to the ground forces. From such document one would hardly imagine that only two years earlier the AAF and Army Ground Forces had been at virtual swords' points over the entire air support issue. The USSBS report stated:

> Armored column cover . . . was of particular value in protecting the unit from enemy air attack and in running interference for the spearhead of the column by destroying or neutralizing ground opposition that might slow it down or stop it . . . .
>
> The decision of the Ninth Air Force to give high priority to armored column cover in a fast-moving or fluid situation from the break-out in Normandy to the final drive across Central Europe made a successful contribution to the success of the ground units in breaking through and encircling the various elements of the German armies . . . . [After addressing immediate support needs] the flight leader patrolled ahead of the armored column, as deep as thirty miles along its axis of advance, in an intensive search for enemy vehicles, troops or artillery. This effort permitted our armor far greater freedom of action than would have been otherwise possible.

Normandy operations, typified by Quesada's armored column cover and Broadhurst's contact cars, thus fulfilled a concept born a quarter-century earlier, amid the mud of Flanders: the notion of the airplane as a *partner* of the tank, as a "counter antitank" weapon. In that war, then-Colonel J.F.C. Fuller, Great Britain's greatest armor advocate, had recognized that cooperation between air and armor forces was "of incalculable importance." Coincidentally, Leigh-Mallory, the commander of Allied tactical air forces in Normandy, had commanded a squadron of tank-cooperation aircraft in the Great War. Perhaps this controversial, gifted airman (who died in a flying accident in November 1944) reflected back in his own mind, as the Normandy campaign unfolded, to those early days of open-cockpit biplanes and awkward, ungainly tanks and the progression of both air and land warfare technology since that time.

The Tank's Formidable Enemies

If the Allied Typhoons and P–47s were friends of British and American armored forces, they also proved implacable enemies of German armored, mechanized, and infantry forces. This was an aspect of warfare—the airplane as *enemy* of the tank—that even the



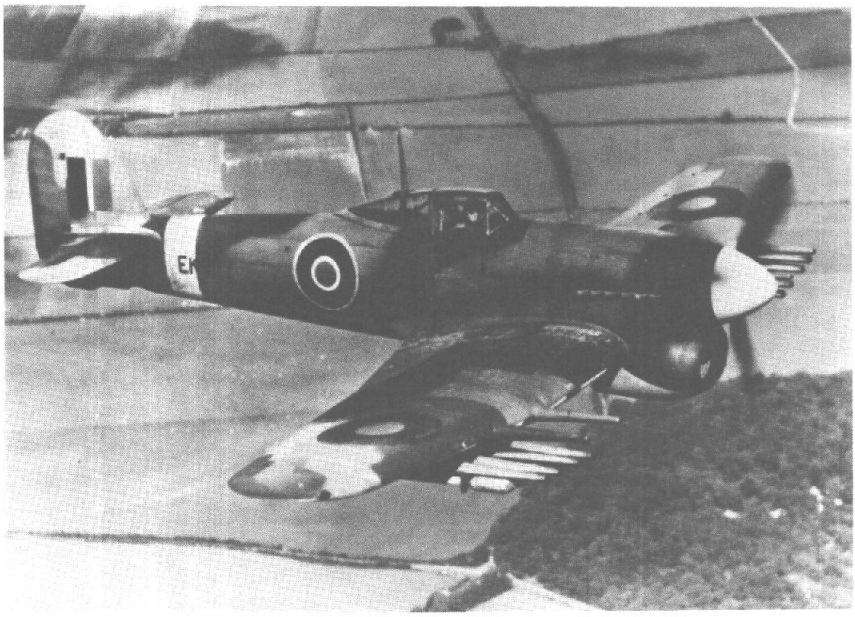
A Republic P-47D Thunderbolt shown with two 500-lb bombs and an external fuel tank, a typical offensive load carried in the 1944 campaign across France.

formidable Fuller had failed to prophesy. In opposing offensive mobile armor, as in North Africa, the fighter-bomber was of limited use. Now, as German armor typically lay in defensive ambush, or retreated in tight columns, the rocket- or bomb-loaded fighter proved devastating.

The Ninth Air Force and the Second Tactical Air Force had vast quantities of fighter-bombers. IX TAC, for example, had twenty-four squadrons of Republic P–47 Thunderbolts, while 2 TAF had eighteen squadrons of Hawker Typhoons. Both were beefy, powerful aircraft, capable of absorbing considerable battle damage and still returning to base. Of the two, the P–47 was the more survivable, in part because it had a radial piston engine. The Typhoon had a liquid-cooled engine and "chin" radiator installation that was vulnerable to ground fire. Affectionately known as the Jug, the P–47, on occasion, returned to base not merely with gaping holes from enemy defenses, but with whole cylinders blown off its engine. Pilot memoirs reveal that while the P–47 was regarded with affection and even fierce loyalty, the Tiffie (as the Typhoon was dubbed) had earned an uncomfortable respect and awe bordering on fear.

Both fighter-bombers had, for their time, prodigious weapons-carrying capabilities. Both could lug up to a 2,000-lb bomb load, one 1,000-lb bomb under each wing. Typically, however, both operated with smaller loads. A P–47 would carry an external belly fuel tank and one 500-lb bomb under each wing; many were also configured so that the plane could carry air-to-ground rockets, typically ten 5-in HVARs (high-velocity aircraft rockets). P–47s on an armed reconnaissance mission would usually operate three flights, two armed with a mix of bombs and rockets, and the cover flight carrying only rockets. Over 80 percent of the bombs dropped by P–47s during the European campaign were 500-lb weapons; less than 10 percent were 1,000-lb bombs, and the difference was made up by smaller 260-lb fragmentation bombs and napalm. While acknowledging the spectacular effects and destructiveness of rockets, the AAF considered bombs more effective for "road work" due to accuracy problems in firing the solid-fuel weapons.

The British, on the other hand, preferred rockets, the Typhoon carrying eight having 60-lb armor-piercing warheads. Possibly this difference of opinion stemmed from launching methods; the P–47s



The Hawker Typhoon was a most formidable swing-role fighter, proving itself a match for the Bf 109 and FW 190. From D-Day onward, it would make its reputation as a destroyer of Nazi armor and motorized transport.

used "zero length" launchers while the Typhoons used launch rails. It could be expected that the rails would impart greater accuracy, stabilizing the rocket immediately after ignition until it had picked up sufficient speed for its tail fins to stabilize it. (There is, however, an interesting report from Montgomery's 21st Army Group that questions the alleged success that British air-to-ground rockets enjoyed against tanks and motorized transport.)

Besides their bomb and rocket payloads, the P–47 and the Typhoon both boasted powerful gun armaments. The Typhoon had four 20mm Hispano cannon. The P–47 carried eight .50 cal. machine guns with 400 rounds per gun, and it proved "particularly successful" against transports. The machine guns occasionally even caused casualties to tanks and tank crews. The .50 cal. armor-piercing bullets often penetrated the underside of vehicles after ricocheting off the road, or penetrated the exhaust system of the tanks, ricocheting around the interior of the armored hull, killing or wounding the crew and sometimes igniting the fuel supply or detonating ammunition storage. This seemed surprising at first, given the typically heavy armor of German tanks. Yet Maj. Gen. J. Lawton "Lightning Joe" Collins, Commander of First Army's VII Corps, was impressed enough to mention to Quesada the success that P–47s had strafing tanks with .50 cal. machine gun fire.

Of course, other fighter-bombers operated in Normandy and across Europe, notably the Lockheed P–38 Lightning, North American P–51 Mustang, and Supermarine Spitfire. With the exception of the Lightning (which had a concentrated armament installation that made it a formidable strafer), all of these proved disappointing. Their liquid-cooled engine systems were quite vulnerable to ground fire, and thus they were used far less for ground attack and much more for air superiority operations.

Allied Air over the Battlefield

Virtually immediately the tactical fighter-bombers of the IX TAC and 2 TAF made their presence felt on the land battle. For the first four days of the invasion, they flew from their bases in southern England, but the first rough airstrips were available for use on the Continent on June 10. Eventually Allied fighter-bomber strips numbered thirty-one in the British zone and fifty in the American. Two problems quickly manifested themselves in these early operations at the front. The peculiar thick dust of Normandy played havoc

with the inline engines of the Spitfire and Typhoon, until mechanics fitted special air filters to the aircraft and engineers watered down the runway surface. Second, these forward strips were perilously close to enemy positions and came under frequent shelling. In one case, Typhoons operating from a forward strip attacked German tanks and fortifications a mere 1,000 yards away from the runway, an operation calling to mind more the experience of the Marines and Army at Guadalcanal or at Peleliu than the European campaign.

The ordeal of the German Panzer-Lehr Division offers a good example of the fate awaiting German ground forces in Normandy. Ordered north to confront the invasion, the armored division got underway in the late afternoon of June 6, and came under its first air attack at 0530 on the 7th near Falaise. Blasted bridges and bombed road intersections hindered movement, particularly of support vehicles. So intense were the attacks along the Vire-Beny Bocage road that division members referred to it as a *Jabo Rennstrecke*—a fighter-bomber race-course. Air attack destroyed more than 200 vehicles on June 7 alone. Despite the rainy weather, which had threatened the Allies' landing on the beachhead, fighter-bombers continued to strike at the Panzer-Lehr Division, to the dismay of German soldiers who had hoped the worsening weather would offer some respite. This was just the beginning of an ordeal that would last throughout the French campaign; Panzer-Lehr was in for some more rough times in the near future.

This division was by no means alone in its trials. The 2d SS Panzer Division Das Reich made its way from Toulouse to Normandy, encountering serious delays en route and, in typical SS fashion, responding by murdering and otherwise brutalizing the civilian population of France. Once the division crossed the Loire, it had a taste of real war; as Max Hastings relates,

> . . . questing fighter bombers fell on them ceaselessly. The convoys of the *Das Reich* were compelled to abandon daylight movement after Saumur and Tours and crawl northwards through the blackout . . . . [During a change of command] an Allied fighter bomber section smashed into the column, firing rockets and cannon. Within minutes . . . sixteen trucks and half-tracks were in flames . . . . Again and again, as they inched forward through the closely set Norman countryside, the tankmen were compelled to leap from their vehicles and seek cover beneath the hulls as fighter bombers attacked. Their only respite came at night.

While darkness offered some protection to the besieged Germans, it did not grant total immunity. The 2 TAF used twin-engine

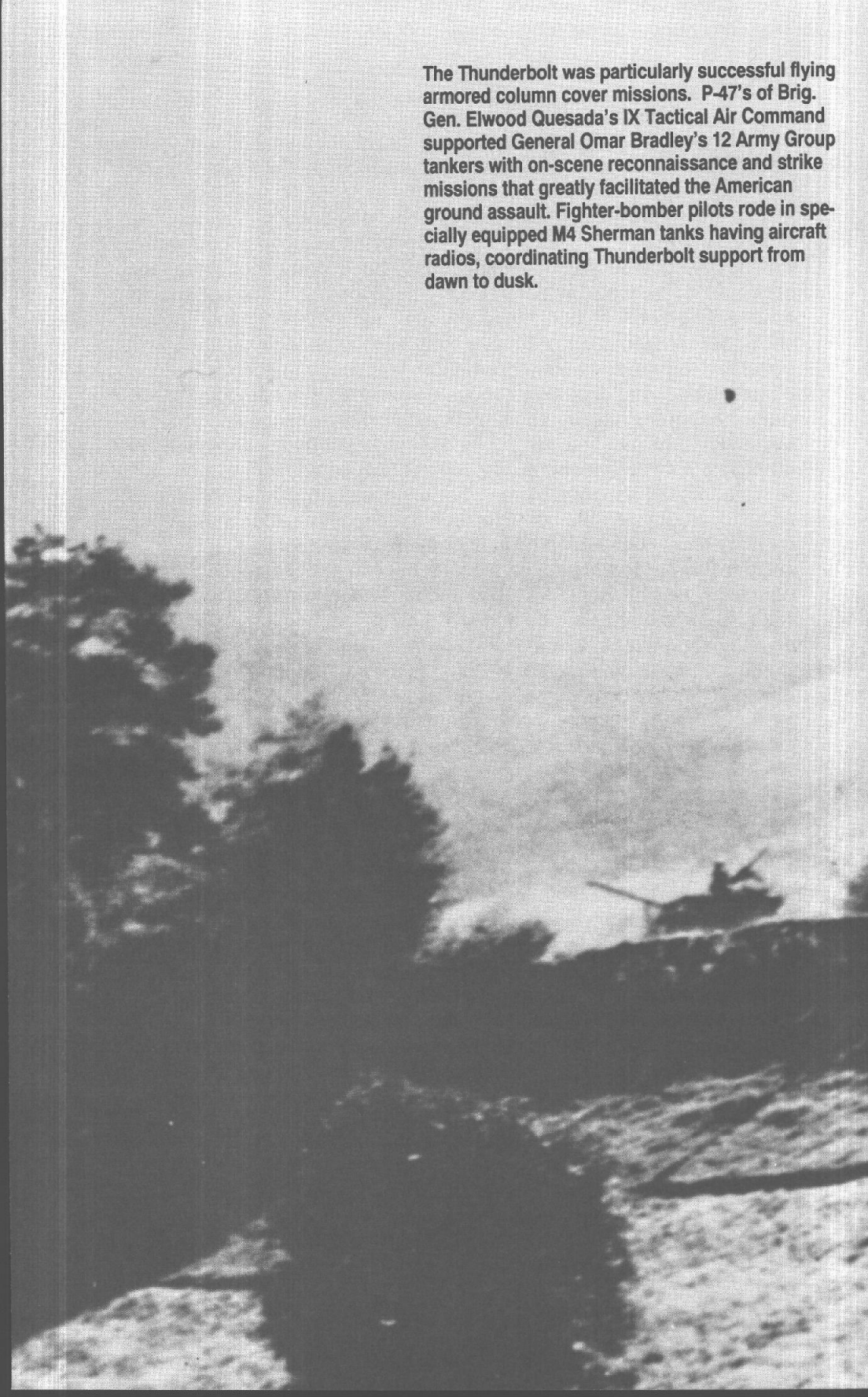
De Havilland Mosquitos as night battlefield interdiction aircraft, sometimes having the "Mossies" bomb and strafe under the light of flares dropped from North American Mitchell medium bombers. Later in the European campaign, when the German night air attack menace had largely disappeared, the AAF used Northrop P–61 Black Widow night fighters in a similar role. Overall, however, their inability to successfully prosecute night attacks to the same degree as daytime attacks frustrated air and ground commanders alike. Bradley's air effects committee noted that there was "never enough" night activity to meet the Army's needs.

Intelligence information from Ultra set up a particularly effective air strike on June 10. German message traffic had given away the location of the headquarters of Panzergruppe West on June 9, and the next evening a mixed force of forty rocket-armed Typhoons and sixty-one Mitchells from 2 TAF struck at the headquarters, located in the Chateau of La Caine, killing the unit's chief of staff and many of its personnel and destroying fully 75 percent of its communications equipment as well as numerous vehicles. At a most critical point in the Normandy battle, then, the Panzer group, which served as a vital nexus between operating armored forces, was knocked out of the command, control, and communications loop; indeed, it had to return to Paris to be reconstituted before resuming its duties a month later.

A Dispirited Rommel

Field Marshal Rommel's reaction to being pinned to the ground by Allied tactical air was a repetition of the feelings he had expressed during the dark days of 1942, when scourged by the Desert Air Force. Already by June 9, Admiral Ruge was writing that "the air superiority of the enemy is having the effect the Field Marshal had expected and predicted: our movements are extremely slow." The next day, Rommel wrote to his wife: "The enemy's air superiority has a very grave effect on our movements. There's simply no answer to it." In walks with Ruge, Rommel continued to complain about the invasion situation, "especially the lack of air support." Ruge concluded that "utilization of the Anglo-American air force is the modern type of warfare, turning the flank not from the side but from above." The situation turned increasingly bleak. By July 6, during a dinner party, a "colonel of a propaganda battalion" remarked that soldiers were constantly asking "Where is the





The Thunderbolt was particularly successful flying armored column cover missions. P-47's of Brig. Gen. Elwood Quesada's IX Tactical Air Command supported General Omar Bradley's 12 Army Group tankers with on-scene reconnaissance and strike missions that greatly facilitated the American ground assault. Fighter-bomber pilots rode in specially equipped M4 Sherman tanks having aircraft radios, coordinating Thunderbolt support from dawn to dusk.

unfortunately, of strategic bomber operations, as the strikes of late July and August clearly indicated.

The most publicized example of the difficulties of operating heavy and medium bombers in support of ground forces came during the preparatory bombardment for Operation Cobra, the breakthrough attack at Saint-Lô that led to the breakout across France. The Cobra strikes killed slightly over 100 GIs and wounded about 500. Without a doubt, the strikes were badly executed, and serious command errors were made. The first came on July 24, a cloudy day, when Cobra had been initially set for launch. A postponement order reached the Eighth Air Force Commander, Lt. Gen. James H. "Jimmy" Doolittle, too late: the Eighth's bombers were already airborne. Most crews wisely refrained from bombing due to weather and returned to base. Some found conditions acceptable and did drop. Friendly casualties occurred in three instances. When another plane in the formation was destroyed by flak, a bombardier accidently toggled his bomb load on an Allied airstrip, damaging planes and equipment. A lead bombardier experienced "difficulty with the bomb release mechanism" and part of his load dropped, causing eleven other bombardiers to drop, thinking they were over the target. Finally, a formation of five medium bombers from the Ninth Air Force dropped seven miles north of the target, amid the 30th Infantry Division. This latter strike inflicted the heaviest casualties—25 killed and 131 wounded—on the first day that Cobra was attempted.

The next day, in better weather, there were three more friendly bombings, all by B–24s. First, a lead bombardier failed to synchronize his bombsight properly, so that when he dropped—and eleven other bombers dropped on his signal—a total of 470 100-lb high-explosive bombs fell behind the lines. Then a lead bombardier failed to properly identify the target and took the easy way out—bombing on the flashes of preceding bombs. A total of 352 260-lb fragmentation bombs fell in friendly lines. In the third case, a command pilot overrode his bombardier and dropped on previous bomb flashes; previous bombs had been off target but within a safe "withdrawal" zone. The pilot's bombs fell within friendly territory.

All of the above errors were incidental to the real causes of the tragic bombings—the restricted size of the bomb zone and confusion over whether the air attack would be flown perpendicular or parallel to the front lines. The Army wanted a parallel attack so that short bombs would not land in friendly territory. (Actually, this approach would not guarantee an absence of friendly casualties.)

The AAF, concerned about the run-in to the target and enemy antiaircraft fire, preferred to fly a perpendicular approach. AAF bomber commanders also recognized that the "heavies" were not as precise as the fighter-bombers. They asked Bradley to keep friendly troops at least 3,000 yards from the bomb line; Bradley compromised on a minimal distance of 1,200 yards, with a preceding fighter bomber attack to cover the next 250 yards so that, in fact, the heavy and medium bombers would strike no closer than 1,450 yards—a distance a heavy bomber would cover in approximately fifteen seconds. A distinct aiming point and a split-second precise drop were thus critical.

Despite Bradley's later claims that the AAF was enthusiastic over the strikes, evidence indicates that the strategic bomber people were anything *but* enthusiastic. In general, the strategic bomber commanders—British as well as American—believed that any diversion from their strategic air campaign against the Nazi heartland weakened their effort. The AAF leadership also had strong feelings—communicated directly to Eisenhower—that the Cobra bombings were questionable because they would involve the dropping of a large quantity of bombs in the shortest possible span of time in a restricted bombing zone. However, the AAF was overruled and the operation went forward. Whenever American bombers executed a perpendicular run, Bradley alleged that it violated a previous decision. After the short bombings of July 24, Bradley had ordered an immediate investigation of why the strike group had flown a perpendicular course. The AAF replied that such a course had been previously agreed upon, and ground forces had been informed. Shortly before his death, in his autobiography, *A General's Life*, Bradley charged that the "Air Force brass simply lied," though earlier writings had been far more temperate. One wonders whether this bold statement merely reflected the hardening of age.

In any case, Bradley reluctantly concurred with AAF plans for another attack on July 25 (though he has stated he did so because he was over an "impossible barrel"). During this series of strikes occurred the most sensational casualty of Cobra. Lt. Gen. Leslie J. McNair, former Commander of Army Ground Forces and currently the "commander" of the fictional "1st Army Group," was killed in his foxhole by a direct bomb hit as he waited to observe the follow-up ground attack. McNair's death and the other friendly casualties infuriated the ground forces, perhaps in part because they remembered the general's vociferous criticism of the air support organization in 1942–43. Strangely, the tragedy seems not to

have harmed ground-air relations at higher command levels. Though Bradley has stated that Eisenhower informed him that strategic bombers should no longer be used to support ground forces, this is not evident from Eisenhower's written comments. In fact, American "heavies" continued to be used in troop support missions, notably in the German winter offensive. Eisenhower's comments after Cobra's bombing were far *less* critical than might have been expected:

> The closeness of air support given in this operation, thanks to our recent experiences, was such as we should never have dared to attempt a year before. We had indeed made enormous strides forward in this respect, and from the two Caen operations [the strikes of July 8 and 18] we had learnt the need for a quicker ground follow-up on the conclusion of the bombing, for the avoidance of cratering and for attacks upon a wider range of targets to the rear and on the flanks of the main bombardment area. Our technique, however, was still not yet perfected, and some of our bombs fell short, causing casualties to our own men. *Unfortunately, perfection in the employment of comparatively new tactics, such as this close-support carpet bombing, is attainable only through the process of trial and error, and these regrettable losses were part of the inevitable price of experience* [emphasis added].

Though the preparatory bombing was tinged with faulty planning, sloppy execution, and bad luck, Operation Cobra itself was a masterful operation. We will probably never know precisely who was responsible for the short bombings. Certainly, the AAF was not entirely to blame. John J. Sullivan's incisive examination of the Cobra operation rightly concluded that there was no duplicity on the part of the AAF (much less "lies"), and that, in fact, the AAF had been most reluctant to undertake the operation at all. The ground commanders did not take adequate precautions to protect their troops, and thus, Sullivan concluded, Bradley and his fellow ground commanders bore "full responsibility" for the bombing casualties to exposed troops. Yet, in fairness, the airmen must share some responsibility—from Tedder and Leigh-Mallory, who did not supervise the operation as thoroughly as they should have, to the individual aircrews who botched their runs.

While there is plenty of blame to go around, one must temper criticism of the Cobra strikes with an appreciation for the losses on the ground during the bitter hedgerow fighting and the effect of the bombing on the German forces. The relatively minor casualties incurred by friendly bombing and the bombing's unqualified success in shattering German resistance (even Bradley was forced to admit that Cobra "had struck a more deadly blow than any of us

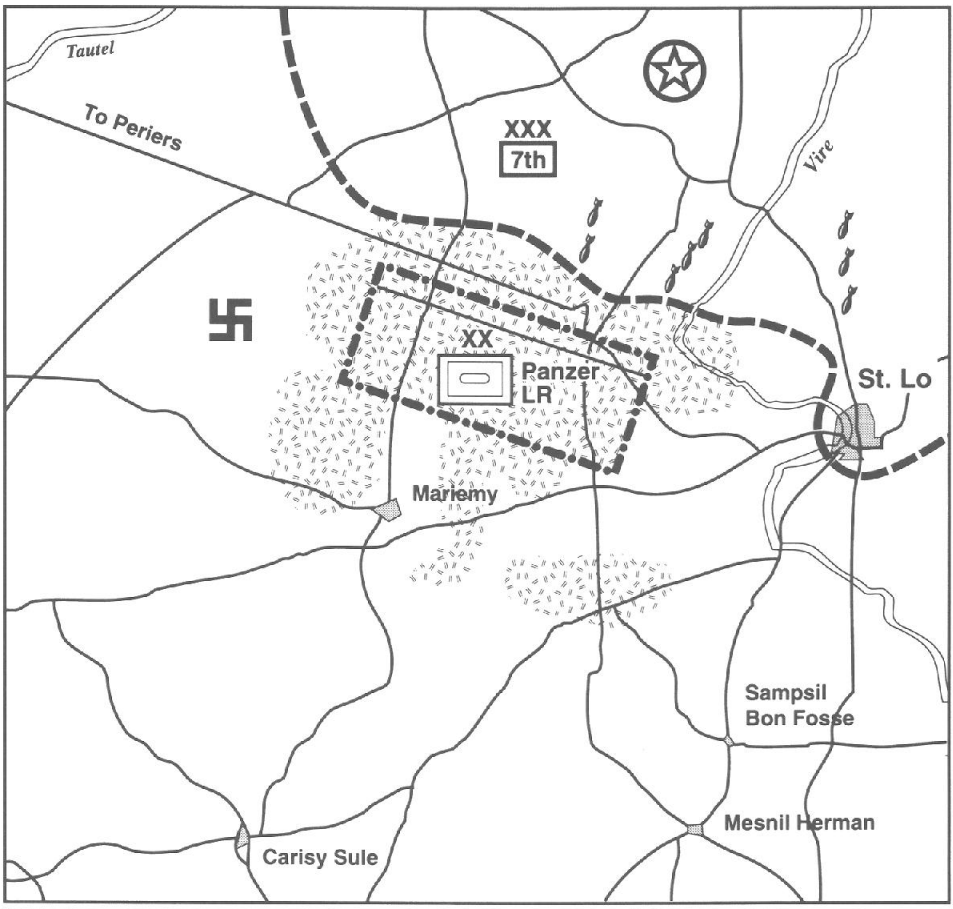
dared imagine") illustrate how petty the uproar surrounding the bombings really was. Unfortunately, in the postwar folklore of air-land operations, too often the short bombing is the only aspect of Cobra that gets attention. Thus, it is refreshing to read Eisenhower's reasonable, mature, and admirable judgment quoted above. The European Theater commander never lost sight of the most important result: the Cobra bombing devastated German forces and paved the way for the breakthrough that would trigger the breakout and roll back the Wehrmacht to the German homeland itself.

Cobra: Key to Breakout

The main weight of the Cobra bombings fell opposite Maj. Gen. J. Lawton Collins's VII Corps, on Lieutenant General Fritz Bayerlein's already battered Panzer-Lehr Division. The initial confusion of the July 24 strikes had misled the German defenders into thinking that they had withstood and repulsed an American attack. They were not prepared for the whirlwind that descended on the 25th. The bombing, Collins recollected, "raised havoc on the enemy side." Though VII Corps, hurting from the accumulated short bombings of two days, did not make great progress in its ground attack on the 25th, Collins shrewdly realized that the German command and control structure had been badly disrupted by the air attack, and he planned a full-scale assault for the next morning. There began the genuine breakthrough. Combat Command A of the 2d Armored Division, ably supported by Quesada's IX TAC and building on the accomplishment of the 30th Infantry Division (which had taken the brunt of the short-bombings), cut through enemy defenses. Breakthrough now became breakout. The stage was set for the drive across Northern Europe.

Bayerlein left a remarkable account of the effects of the Cobra bombing and ground assault on his already war-weary command. In response to postwar interrogation he wrote:

> We had the main losses by pattern bombing, less by artillery, still less by tanks and smaller arms.
>
> The actual losses of dead and wounded were approximately:
>
> | | |
> |---|---|
> | by bombing | 50% |
> | by artillery | 30% |
> | by other weapons | 20% |



Operation Cobra: The Bombing Pattern

> The digging in of the infantry was useless and did not protect against bombing . . . . Dugouts and foxholes were smashed, the men buried, and we were unable to save them. The same happened to guns and tanks . . . . It seems to me, that a number of men who survived the pattern bombing . . . surrendered soon to the attacking infantry or escaped to the rear.
>
> The first line has [*sic*] been annihilated by the bombing. . . . The three-hour bombardment on 25.7—after the smaller one a day before—had exterminating morale effect on the troops physically and morally weakened by continual hard fighting for 45 days. The long duration of the bombing, without any possibility for opposition, created depressions and a feeling of helplessness, weakness and inferiority. Therefore the morale attitude of a great number of men grew so bad that they, feeling the uselessness of fighting, surrendered, deserted to the enemy or escaped to the rear, as far as they survived the bombing. Only particularly strong nerved and brave men could endure this strain.
>
> The shock effect was nearly as strong as the physical effect (dead and wounded). During the bombardment. . . some of the men got crazy and were unable to carry out anything. I have been personally on 24.7 and 25.7 in the center of the bombardment and could experience the tremendous effect. For me, who during this war was in every theater committed at the points of the main efforts, this was the worst I ever saw.
>
> The well-dug-in infantry was smashed by the heavy bombs in their foxholes and dugouts or killed and buried by blast. The positions of infantry and artillery were blown up. The whole bombed area was transformed into fields covered with craters, in which no human being was alive. Tanks and guns were destroyed and overturned and could not be recovered, because all roads and passages were blocked . . . .
>
> Very soon after the beginning of the bombardment every kind of telephone communication was eliminated. As nearly all C.P.'s [Command Posts] were situated in the bombed area, radio was almost impossible. The communication was limited to [motorcycle] messen-gers, but this was also rather difficult because many roads were interrupted and driving during the bombardment was very dangerous and required a lot of time.

By any standard, the Cobra bombing had an extraordinary effect on the German defenders, and as the official Army history of the Normandy campaign acknowledges, the Cobra bombing constituted the "best example in the European theater of 'carpet bombing.'" This, of course, does not mean that the subsequent campaign on land was a pushover, for throughout the war, the decimated Panzer-Lehr Division and many other battered Nazi units showed an amazing resiliency, reforming, recuperating, and continuing to fight. Nevertheless, the Cobra operation did put the German army in France on the skids. Ironically, it would be a Nazi command

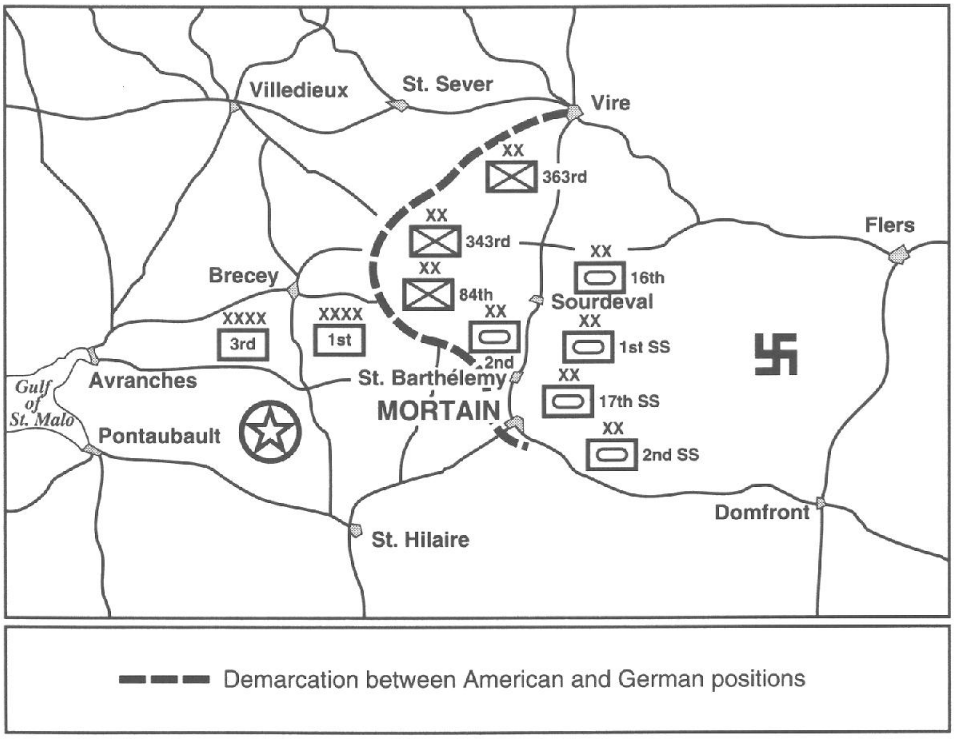
decision which would set the stage for total German destruction in Northern France.

TacAir Omnipotent: Mortain and the Falaise-Argentan Pocket

Mortain and Falaise, like Wadi el Far'a, Guadalajara, and more recently Mitla Pass and the Kuwait City–Basra Road, have come to symbolize a particular form of warfare: the destruction of closely packed columns of troops and vehicles by constant and merciless fighter-bomber strikes in concert with action on the ground. Any chance of withdrawing with troops, equipment, and vehicles in good order was lost to the Wehrmacht due to the violence of the breakout from the beachhead at Normandy, and Hitler's order to von Kluge to stand firm in Normandy. As a result of Hitler's directive, the Wehrmacht launched a general offensive against Mortain, the weakest spot in the Allied line, on August 7. It failed amid stubborn resistance on the ground and intensive fighter-bomber attacks.

Next Allied forces began to batter the enemy ground forces caught in the Falaise-Argentan pocket—fighting characterized by combined infantry-armor-artillery-air attacks directed against units desperately attempting to escape eastward. Though some German forces did escape through the ever-narrowing gap, they did so without equipment and in a state of disarray and almost complete demoralization. By the end of August, Allied forces had liberated Paris, advanced to the Seine, won the Battle of France, and set the stage for the Battle of Germany. Ahead lay some particularly bitter fighting—notably Montgomery's botched airborne invasion of Holland and the ferocity of the German counterthrust in the Ardennes. But as of the end of August, only the most ardent Nazi would still have faith in an ultimate German victory.

The attack on Mortain was allegedly revealed by Ultra—the Allies' breaking of the German codes—so that the American forces were able to set up their defense in advance of the German thrust. This might be called the "myth of Mortain." In fact, Ultra *did not* offer a forewarning enabling the defenders to prepare for the attack. On August 2, Hitler had ordered von Kluge to prepare for an attack westward to the coastline, but this early indication of trouble ahead did not make its way from the Allied intelligence organizations to Bradley's 12th Army Group. On the evening of the 6th, orders went



The Mortain Counterattack
(Situation as of 1200 hours, August 7)

out for five Panzer divisions to attack through Mortain (which had already fallen to American troops) ninety minutes later—at 1830 hours. Ultra did not send out this message until midnight, but the German attack had itself been delayed in the field until just after midnight. The Allied signals arrived immediately before the German attack, offering the Americans no time whatsoever to make extensive plans or redeployments for the assault.

Bradley, in his autobiography *A General's Life* is understandably testy about allegations that Mortain was predetermined by Ultra intelligence. His argument that he waged the battle without benefit of forewarning is borne out by the account of former Ultra intelligence analyst Ralph Bennett, who refreshed his own recollections by extensive research into the actual Ultra messages themselves. Bennett has stated that German update information during the Mortain fighting furnished "cheerful reading" to the analysts, but added little, if anything, to the information Bradley and Montgomery already had in the field from their own combat intelligence operations.

When the Ultra message did come in, Bradley ordered "all-out" air support the following morning, by which time the American 30th Infantry Division was locked in desperate and stubborn combat with the German tanks. Even here Ultra played only a minor role, since the midnight attack would have triggered a day of Allied air support anyway, from battlefield requests. During this fighting, the rocket-firing Typhoons of the RAF's 2 TAF had the responsibility of defending the ground forces and attacking German columns, while the AAF's Ninth AF flew interdiction and air superiority sorties. For the Mortain operation, the Luftwaffe centralized its few fighter resources and attempted to intervene over the battlefield, but the deep cover American air superiority sweeps gobbled them up as they took off, and "not one" (as Lieutenant General Hans Speidel dismally recalled) appeared over the battlefield. The skies over Mortain belonged to the RAF. The weather was poor in the early morning, but as the day went on, the overcast lifted and patches of blue appeared. As the weather improved, Typhoons swarmed over the area, so many, in fact, that some got in each other's way, and several mid-air collisions apparently resulted. A morning recce flight located German tanks near St. Barthélemy, and thereafter, between the first engagements (just after noon) and late afternoon, Typhoons flew a total of 294 sorties over the battlefield.

Typhoon pilot John Golley left a graphic account of operations at Mortain, particularly the battle between 245 Squadron (which

was especially active) and the 1 SS Panzer Division on the road near St. Barthélemy. Their first attacks sprayed the tanks and transports with rocket and cannon fire, and a thin haze of smoke and dust spread slowly over the Norman countryside. The Typhoons broke off as they exhausted their ammunition and rockets, returning again and again to their strip to refuel and rearm. So intensive were the sortie rates that 245 Squadron, ever afterward, referred to August 7 as "The Day of the Typhoon."

German commanders were shocked at the magnitude of the air attacks at Mortain, which would be repeated before the month was out at Falaise. On the ground, the 30th Infantry Division stood firm, repulsing the German forces that did close to engage them. Air had saved the day at Mortain, at least preventing a local German success that might have prolonged the campaign in France. As Eisenhower reported:

> The chief credit in smashing the enemy's spearhead, however, must go to the rocket-firing Typhoon planes of the Second Tactical Air Force. They dived upon the armored columns, and, with their rocket projectiles, on the first day of the battle destroyed 83, probably destroyed 29 and damaged 24 tanks in addition to quantities of "soft-skinned" M.T. [Motorized Transport]. The result of this strafing was that the enemy attack was effectively brought to a halt, and a threat was turned into a great victory.



During the battle of Mortain, Typhoons devastated German tank and mechanized columns attempting to reach the French coast. Above is the result of one such attack.

With the Nazi spearhead smashed, Mortain degenerated into a five-day slugfest. Foolishly, for a time the Germans continued to press toward Avranches, a move Bradley subsequently termed "suicidal," for Collins's VII Corps was in position to attack the German flanks. Elements of the 2 SS Panzer Division, operating south of the devastated 1 SS Panzer Division, besieged Hill 317, in whose shadow Mortain is nestled. The defenders, a lone battalion, stood firm. Supported by Allied air (including supply drops) and artillery, this battalion heroically held out until relieved by the 35th Division on August 12. Mortain came to an end. In the fighting after August 7, the 2 SS Panzer had joined the rapidly growing roster of German armored formations shattered by Allied combined air-artillery-armor assault. Major General Rudolf-Christoph Freiherr von Gersdorff, the chief of staff of the German 7 Armee, subsequently agreed that the continuation of the counterattack toward Avranches was a "mistake." Contributing to the German failure was the overemphasis of attacking north, between Mortain and Vire rather than farther south. In any case Mortain must be counted among the most important battles in the west and recognized for what it was—a true example of air-land action. It set the stage for the next and even greater disaster to befall German arms in France—the battle of the Falaise-Argentan pocket. After Mortain, the only course open to the Wehrmacht was headlong retreat toward the German frontier. In that retreat, Allied tactical air would offer no respite.

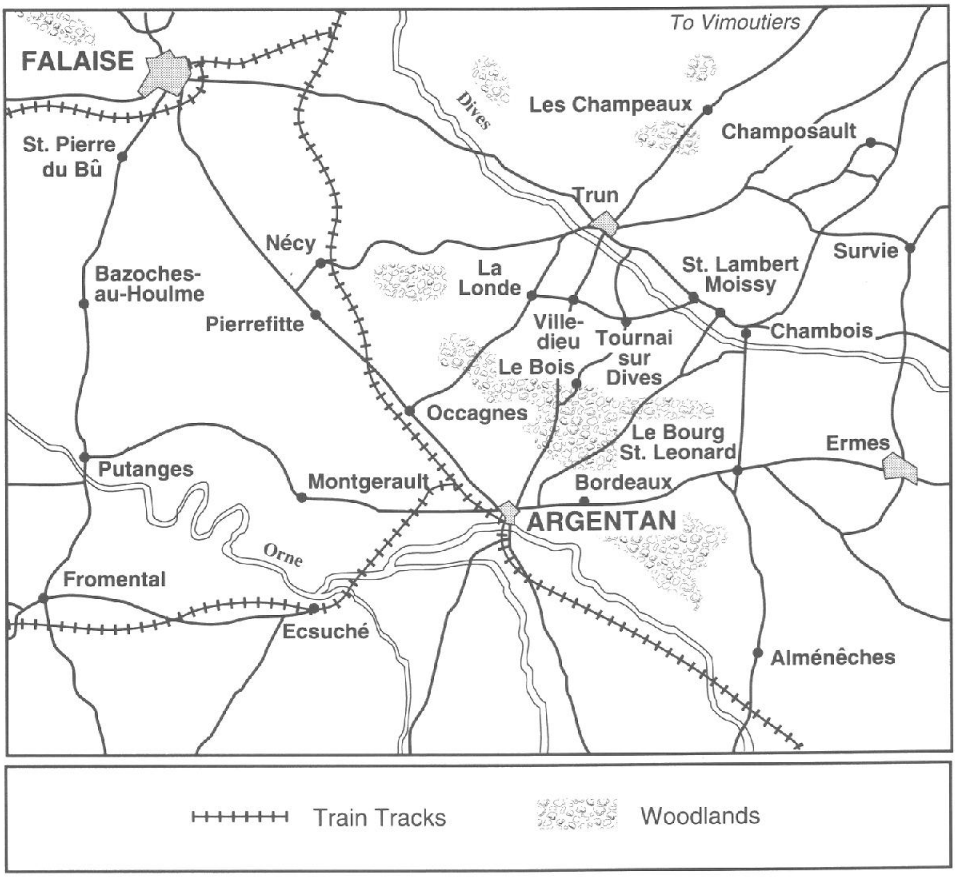
Closing the Gap at Falaise

In retrospect, air was more critical—and under greater pressure—at Mortain than at the subsequent fighting in the Falaise-Argentan pocket. Mortain was an Allied defensive battle whereas Falaise was an encirclement and an attempt to prevent the Germans from escaping out of the trap eastward. As the perimeter closed down, the pocket became a gap, and the Allies struggled to close it. The Falaise campaign probably began on August 7, the same day as the German counterattack at Mortain, when Canadian troops launched a ground assault called Totalize toward Falaise. For the next two weeks, Allied troops—British, American, and Polish—harassed the German forces caught inside the pocket until finally, on August 21, the gap was closed.

But by that time, what could have been a great encirclement echoing some of the pivotal battles on the Eastern Front had become something less—a victory, but one qualified by the number of German forces that had been able to flee through the gap. The fact that enemy forces did escape outraged American commanders, from the even-tempered Eisenhower and Bradley to the mercurial Patton. They saw it as yet another example of bad generalship by Montgomery, who pressured the pocket's western end, squeezing the Germans out eastward like a tube of toothpaste, rather than capping the open gap. Patton, ever aggressive, pleaded with Bradley for clearance to cut across the narrow gap, in front of retreating German forces, from Argentan north to Falaise. But Bradley wisely demurred, recognizing that the outnumbered Americans might be "trampled" by the German divisions racing for the gap. "I much preferred," Bradley recollected subsequently, "a solid shoulder at Argentan to the possibility of a broken neck at Falaise."

Eventually, the Canadians pressed south from Falaise, the Americans north from Argentan, and both sought to narrow and close the gap by reaching the road network across and beyond the Dives River, at Trun, St. Lambert, Moissy, and Chambois. The roads beyond led toward Vimoutiers, funneling German forces into predictable killing grounds. Polish forces fought an especially prolonged and bitter struggle at Chambois that echoed Mortain's lone battalion. On August 19, the Poles seized Chambois (soon dubbed "Shambles"), establishing defensive positions on Mont Ormel, to the northeast. Here was an ideal vantage point to call in artillery and air strikes on the German forces streaming across the Dives and past their positions.

Extremely bitter fighting broke out between Polish and retreating German forces, but the Poles were able to retain control until the gap closed on August 21. The countryside around the Dives and Orne rivers was generally open, with sporadic patches of forested areas. The high ground across the Dives—specifically Mont Ormel—furnished an unparalleled vista of the entire gap area. In the third week of August 1944, this vista was marred by the near-constant bursting of bombs, rockets, and artillery, the ever-present drone of fighter-bombers and small artillery spotters (the latter especially feared and loathed by German forces), the corpses of thousands of German personnel and draft animals, and the burning and shattered remains of hundreds of vehicles and tanks. It was a scene of carnage without parallel on the Western Front.



The Falaise-Argentan Pocket

In the days before the closing of the Falaise gap, the 2 TAF averaged 1,200 sorties per day. The air war was particularly violent from August 15 through the 21st. Typhoons and Spitfires attacked the roads leading from the gap to the Seine, strafing columns of densely packed vehicles and men. Under repeated attack, some of the columns actually displayed white flags of surrender, but the RAF took "no notice" of this since Allied ground forces were not in the vicinity, and "to cease fire would merely have allowed the enemy to move unmolested to the Seine." Typhoons typically would destroy the vehicles at the head of a road column, then leisurely shoot up the rest of the vehicles with their rockets and cannon. When they finished, Spitfires would dive down to strafe the remains.

Because the Luftwaffe was absent over the battlefield, Broadhurst directed 2 TAF wings to operate their aircraft in pairs. Thus, a "two ship" of Spitfires or Typhoons could return to the gap after being refueled and rearmed without waiting for a larger formation to be ready to return. This maximized the number of support sorties that could be flown, and, indeed, pilots of one Canadian Spitfire wing averaged six sorties per day. Nothing that moved was immune from what one Typhoon pilot recollected as "the biggest shoot-up ever experienced by a rocket Typhoon pilot." Another recalled the flavor of attack operations:

> The show starts like a well-planned ballet: the Typhoons go into echelon while turning, then dive on their prey at full throttle. Rockets whistle, guns bark, engines roar and pilots sweat without noticing it as our missiles smash the Tigers. Petrol tanks explode amid torrents of black smoke. A Typhoon skids away to avoid machine fire. Some horses frightened by the noise gallop wildly in a nearby field.

Nor was Falaise strictly a 2 TAF operation; the AAF was also heavily committed. Over the duration of the Falaise fighting, air strikes gradually moved from west of Argentan to north, to east, and finally to east of the Dives River. One strike by P–47s on August 13 gives a graphic indication of the sizes of German forces open to attack:

> That morning 37 P–47 pilots of the 36th Group found 800 to 1,000 enemy vehicles of all types milling about in the pocket west of Argentan. They could see American and British forces racing to choke off the gap. They went to work. Within an hour the Thunderbolts had blown up or burned out between 400 and 500 enemy vehicles. The fighter-bombers kept at it until they ran out of bombs and ammunition. One pilot, with empty gun

chambers and bomb shackles, dropped his belly tank on 12 trucks and left them all in flames.

All told, on 13 August, XIX TAC fighter-bombers destroyed or damaged more than 1,000 road and rail vehicles, 45 tanks and armored vehicles, and 12 locomotives. Inside the pocket they reduced 10 enemy delaying-action strong points to rubble.

Four days later another Thunderbolt squadron, below-strength, flew over a huge traffic jam, radioed for assistance, "and soon the sky was so full of British and American fighter-bombers that they had to form up in queues to make their bomb runs." The next day, 36th Group Thunderbolts spotted another large German formation, marked out by yellow artillery smoke. Since the vehicles were in a zone designated as a British responsibility, XIX TAC sat back "disconsolately" while 2 TAF launched a series of strikes that claimed almost 3,000 vehicles damaged or destroyed. On August 19, one Spitfire wing put in a claim for 500 vehicles destroyed or damaged in a single day; that same day, another Spitfire wing claimed 700.

The Corridor of Death

Nothing and no one was immune from attack. Colonel Heinz-Gunther Guderian, son of the victor of Sedan, was seriously wounded when his Volkswagen was strafed and set ablaze by an Allied fighter. Major General von Gersdorff was strafed and slightly wounded by a P–38 Lightning at Chambois, and he subsequently reported that "The very strong low flying attacks . . . caused high losses . . . . units of the Army were almost entirely destroyed by low flying attacks and artillery." One country road eastward from Moissy earned the grim sobriquet *le Couloir de la Mort*: the Corridor of Death. At night, intruder aircraft attacked river crossings and ferries over the Dives. At least 10,000 German soldiers died, and 50,000 fell prisoner. Nearly 350 tanks and self-propelled guns, nearly 2,500 other vehicles, and over 250 artillery pieces had been lost in the northern section alone of the Falaise pocket. Von Gersdorff stated that armored divisions that did withdraw from the gap had "extremely low" strength. For example, the 1 SS Panzer had only "weak infantry" and no tanks or artillery; the 2 Panzer had one battalion, no tanks, and no artillery; the 12 SS Panzer had 300 troops and no tanks; the 116 Panzer had two battalions, twelve tanks, and two artillery batteries; and the 21

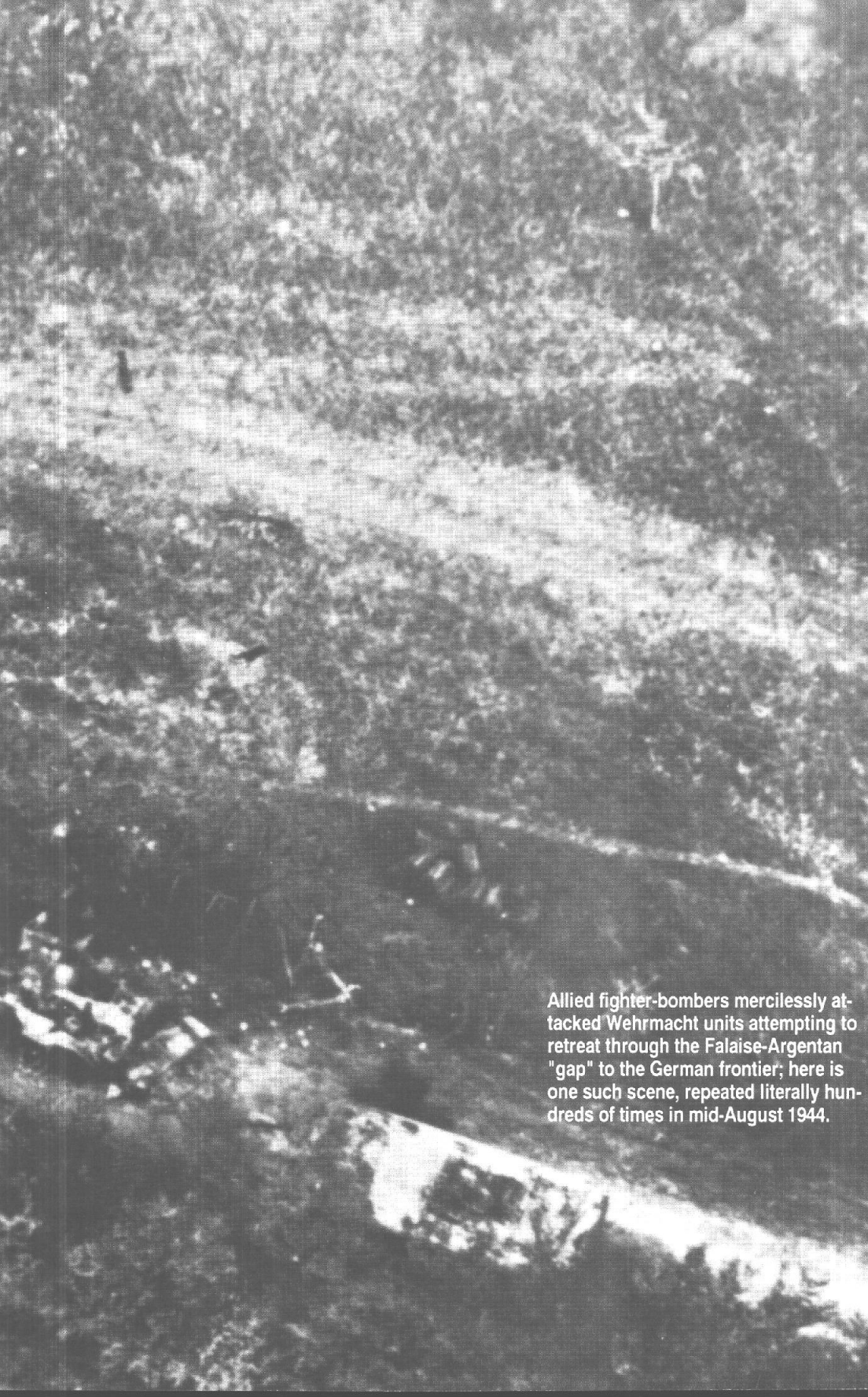
Panzer had four battalions and ten tanks. As historian Max Hastings has shown, these figures were by no means unique; four other SS Panzer Divisions could muster no more than fifty tanks among them. (Wehrmacht armored divisions typically possessed an organizational strength of 160 tanks, and approximately 3,000 other vehicles.) The carnage of the battlefield was truly incredible and sickened many fighter-bomber pilots over the site. Eisenhower, touring the gap area two days after it closed, encountered "scenes that could only be described by Dante." Perhaps the twisted allegories of Hieronymous Bosch would have been more fitting a choice, for Dante, at least, offered hope.

With the conclusion of the battle of the Falaise gap came the denouement of the battle of Normandy. These Allied successes did not end the war, which would rage on for another nine months. But Normandy triggered the ultimate defeat of Nazi Germany. Though much has been written by critics about the remarkable ability of the Wehrmacht to rejuvenate and reform itself, and about the "toughening" and "thickening" of German resistance in the weeks and months ahead, not enough attention is paid to the flip side of this: Where was that strength coming from? German forces were being hastily transferred from the Russian Front (brightening the prospects of an eventual Soviet triumph in the East) and from within the critical bone marrow of the Third Reich itself. Hitler and his minions were spending capital they did not have. The toughening of the resistance at the Western Front was the thickening of a crust—a crust that the Allies would slice through in the fall and winter of 1944–45, exposing the vulnerable Nazi heartland underneath.

The Legacy of Air Power at Normandy

By the end of the Normandy campaign, all the elements and relationships for the rest of the tactical air war in Europe were in place: forward observers and controllers, occasional airborne controllers, radar strike direction, "on-call" fighter-bombers, armored column cover, night intruders, to name just a few. In only thirty-six months, the Allies had recovered from the disappointment of a Brevity and Battleaxe to orchestrate an unprecedented invasion and breakout. Normandy was neither the victory of a single branch of arms, nor the victory of a single nation. Instead, it is the classic example of complex combined arms, multiservice, coalition war-





Allied fighter-bombers mercilessly attacked Wehrmacht units attempting to retreat through the Falaise-Argentan "gap" to the German frontier; here is one such scene, repeated literally hundreds of times in mid-August 1944.

fare. The battlefield triumphs of air power were part and parcel of infantry-artillery-armor assaults on the ground. It was true air-land battle.

The effectiveness of the Anglo-American air support at Normandy—and through the collapse of Germany as well—is beyond question, attested to alike by airmen, ground commanders on both sides, soldiers in the field, and prisoners of war. A battalion commander in an armored regiment reported:

> Our air cover has been excellent and has helped us out of many tight spots. At El Boeuf they knocked out eight German Mark V [Panther] and Mark VI [Tiger] tanks that were giving us a great deal of trouble. They also helped us at Tessy-sur-Vire by knocking out tanks. They are on call by any unit down to a platoon, calling through company and battalion, and giving the location of the target. Then the ASPO [Air Support Party Officer] contacts the air cover and gets a strike within a matter of minutes. I have seen the air strike within three minutes after the call was made. We like to know the air is there. We want it all the time.

Two other battalion commanders from the same regiment endorsed his remarks. VII Corps's "Lightning Joe" Collins stated that "we could not possibly have gotten as far as we did, as fast as we did, and with as few casualties, without the wonderful air support that we have consistently had."

According to Bradley's 12th Army-Group air effectiveness committee, fighter-bombers in particular proved valuable for a number of missions, including operations within striking range of artillery. Only when used against heavily constructed positions such as casemated guns and pillboxes did they prove "not particularly effective." Fighter-bombers were actually more accurate than long-range heavy artillery, specifically the 240mm howitzer and the 8-in gun or howitzer. Armed with 500-lb general purpose and 260-lb fragmentation bombs, fighter-bombers—particularly the rugged P–47—routinely conducted close-in strikes within 300 to 500 yards of friendly troops.

Pure bombers were a different matter, however. Mediums (such as the B–25, B–26, and even the A–20 and its successor the Douglas A–26 Invader) were considered as a mixed blessing. While they were not as criticized as the occasionally errant "heavies," commanders felt that they lacked the strong control and communication relationship with medium bomber units that they had with the fighter-bombers. Mediums were also seen as too inflexible: they lacked the quickness, ease of response, and availability of the fighters. Though heavy bombers were devastatingly effective in the

Cobra breakthrough, they had inherent disadvantages compared with fighter-bombers, namely the problem of friendly casualties and the need for a large safety area between friendly forces and the target. All of this reinforced a generalized view from the ground that air support could best be delivered by the fighter-bomber. And despite all the brouhaha of the early war years concerning dive bombers, arguments favoring them for battlefield air support had disappeared by the spring of 1945, as had arguments for specialized battlefield attack aircraft. The "attack" airplane was dead; long live the fighter-bomber.

Yet, when confronted with dense light antiaircraft fire, fighter-bombers did take losses. IX TAC lost a total of eighty aircraft from July 25 through August 7, 49 percent from flak, 7 percent to enemy aircraft, 24 percent to small-arms fire, and 20 percent from unknown causes. Thus 73 percent—and possibly more nearly 90 percent—of combat losses came from some form of light or heavy ground fire. Undoubtedly the rugged construction and dependability of the P–47's air-cooled engine prevented even further losses, a luxury the liquid-cooled Typhoon lacked. Wolfgang Pickert, a General der Flak-Artillerie in charge of the III Flak Korps, reported that in "fighter-bomber weather . . . the movement of large vehicles during the hours of daylight was practically tantamount to their certain loss." But when light antiaircraft forces were present in sufficient strength (a rarity in Normandy), "fighter-bombers had hardly any successes, or only with heavy losses." III Flak Korps had one regiment in the Falaise pocket during the hectic withdrawal eastward, and by good fortune it had an unlimited supply of ammunition due to its proximity to III Flak Korps ammunition depots. Pickert alleged that the regiment "reported that it had inflicted heavy casualties on the enemy and had put numerous enemy tanks and planes out of action," though this claim does not seem warranted from other accounts. Also, antiflak artillery fire immediately prior to, or during air strikes benefitted Allied close air support operations—a reminder of the necessity for air and land forces to work together to achieve victory on the battlefield.

Even allowing for some exaggeration and duplicate claims, the sortie claims of the Ninth AF and 2 TAF during the Normandy fighting is most impressive.

Fighter-bomber sortie claims in Normandy

	2 TAF	9 AF	Total
Sorties flown	9,896	2,891	12,787
Claims for motor transport destroyed	3,340	2,520	5,860
Claims for armor destroyed	257	134	391
Total claims	3,597	2,654	6,251
Claims per sortie	0.36	0.92	0.49

No stronger endorsement of the air support in Normandy can be found than Omar N. Bradley's letter to AAF Commanding General "Hap" Arnold at the end of September 1944. "I cannot say too much for the very close cooperation we have had between Air and Ground," Bradley wrote. "In my opinion, our close cooperation is better than the Germans ever had in their best days."

Over the decades, the Normandy invasion and breakout has become the classic example of Second World War combined-arms, mechanized, air-land, coalition warfare. Fortunately, the Allies possessed not merely air superiority, but air supremacy, making victory on the ground that much easier. The Allies had won the critical battle for air supremacy, not over the beachhead, but in several years of air war that had gutted the Luftwaffe. To those inclined to minimize the value of air to the Normandy operation, the final word must come from Eisenhower himself.

In June 1944, John S. D. Eisenhower, Ike's son, graduated from West Point—ironically on the same day that Allied forces stormed ashore at Normandy. June 24 found the new lieutenant riding through Normandy with his father, observing the aftermath of the invasion:

> The roads we traversed were dusty and crowded. Vehicles moved slowly, bumper to bumper. Fresh out of West Point, with all its courses in conventional procedures, I was offended at this jamming up of traffic. It wasn't according to the book. Leaning over Dad's shoulder, I remarked, "You'd never get away with this if you didn't have air supremacy." I received an impatient snort:
>
> "If I didn't have air supremacy, I wouldn't be here."

Suggested Readings

This booklet has been adapted and edited from the author's *Strike From the Sky: The History of Battlefield Air Attack, 1911–1945* (Washington, D.C.: Smithsonian Institution Press, 1989.)

AAF Evaluation Board in the ETO, *The Effectiveness of Third Phase Tactical Air Operations in the European Theater, 5 May 1944–8 May 1945.* Dayton, Ohio: Wright Field, Feb. 1946. Copy in the archives of the U.S. Military History Institute (MHI).

Bayerlein, Fritz. "Panzer-Lehr Division (24–25 Jul 44)." Manuscript A–902. N.p. Historical Division, Headquarters, U.S. Army, Europe, n.d.

Bennett, Ralph. *Ultra in the West: The Normandy Campaign 1944–45.* New York: Charles Scribner's Sons, 1979.

Blumenson, Martin. *Breakout and Pursuit,* a volume in the series *United States Army in World War II.* Washington, D.C.: Office of the Chief of Military History, 1961.

Bradley, Omar N., and Air Effects Committee, 12th Army Group. *Effect of Air Power on Military Operations, Western Europe.* Weisbaden, Germany: U.S. 12th Army Group Air Branches of G–3 and G–2, July 15, 1945.

Bradley, Omar N., and Clay Blair. *A General's Life: An Autobiography.* New York: Simon and Schuster, 1983.

Collins, J. Lawton. *Lightning Joe: An Autobiography.* Baton Rouge: Louisiana State University Press, 1979.

Coningham, Arthur. "The Development of Tactical Air Forces." *Journal of the United Services Institute 9* (1946).

Craven, Wesley Frank, and James Lea Cate, eds. *The Army Air Forces in World War II,* Vol. 2, *Europe: Torch to Pointblank.* Chicago: University of Chicago Press, 1949.

———. *The Army Air Forces in World War II,* Vol. 3, *Europe: Argument to V–E Day.* Chicago: University of Chicago Press, 1951.

Demoulin, Charles. *Firebirds! Flying the Typhoon in Action.* Washington, D.C.: Smithsonian Institution Press, 1988.

Eisenhower, Dwight D. *Crusade in Europe.* Garden City, N.Y.: Doubleday, 1948.

———. *Supreme Commander's Dispatch for Operations in Northwest Europe, 6 June–8 May 1945.* SHAEF, n.d. Document catalogued as D756 A24c c.2 in the MHI library.

Eisenhower, John S.D., *Strictly Personal.* Garden City, N.Y.: Doubleday, 1974.

Ellis, Lionel F. *Victory in the West.* Vol. 1, *The Battle of Normandy.* London: HMSO, 1962.

Golley, John. *The Day of the Typhoon: Flying with the RAF Tankbusters in Normandy.* Wellingborough, Eng.: Patrick Stephens, 1986.

Hastings, Max. *Das Reich: The March of the 2d Panzer Division through France.* New York: Jove Books, 1983 ed.

———. *Overlord: D-Day and the Battle for Normandy.* New York: Simon and Schuster, 1984.

Jacobs, William A. "Tactical Air Doctrine and AAF Close Air Support in the European Theater, 1944–1945." *Aerospace Historian* 27, no. 1 (March 1980).

Leigh-Mallory, Trafford. "Air Operations by the A.E.A.F. in N.W. Europe from 15th November, 1943, to 30th September, 1944." *Royal Air Force Quarterly* 18, no. 4 (October 1947).

Liddell Hart, B.H. ed., with the assistance of Lucie Maria Rommel, Manfred Rommel, and General Fritz Bayerlein. *The Rommel Papers.* New York: Harcourt, Brace and Co., 1953.

Mellenthin, F.W. von. *Panzer Battles: A Study of The Employment of Armor in the Second World War.* New York: Ballantine Books, 1971 ed.

Murray, Williamson. *Luftwaffe.* Baltimore: Nautical & Aviation Publishing Co., 1985.

Quesada, Elwood. "Oral History Memoir." An interview by Steve Long and Ralph Stephenson. MHI Senior Officers' Debriefing Program, n.d. Transcript in the MHI archives.

———. "Tactical Air Power." *Air University Quarterly Review* 1, no. 4 (Spring 1948).

Richards, Denis, and Hilary St. George Saunders. *Royal Air Force: 1939–1945.* Vol. 2, *The Fight Avails.* London: HMSO, 1954.

Ruge, Friedrich. *Rommel in Normandy: Reminiscences by Friedrich Ruge.* San Rafael, Calif.: Presidio Press, 1979.

Saunders, Hilary St. George. *Royal Air Force 1939–1945,* Vol 3, *The Fight is Won.* London: HMSO, 1954.

Slessor, John. *The Central Blue: The Autobiography of Sir John Slessor, Marshal of the RAF.* New York: Frederick A. Praeger, 1957.

Steadman, Kenneth A. *A Comparative Look at Air-Ground Support Doctrine and Practice in World War II.* A Combat Studies Institute Study. Ft. Leavenworth, Kans.: U.S. Army Command and General Staff College, Sept. 1, 1982.

Sullivan, John J. "The Botched Air Support of Operation Cobra." *Parameters: The U.S. Army War College Quarterly* 18, no. 1 (March 1988).

Tedder, Sir Arthur. *With Prejudice: The War Memoirs of Marshal of the Royal Air Force Lord Tedder G.C.B.* Boston: Little, Brown and Company, 1967.

Terraine, John. *A Time for Courage: The Royal Air Force in the European War, 1939–1945.* New York: Macmillan Publishing Company, 1985.

U.S. 12th Army Group, *Battle Experiences.* A large bound collection of the accumulated "lessons learned" reports filed by 12th Army Group. Copy in the MHI library.

U.S. War Department. Field Manual FM 100–20, *Command and Employment of Air Power.* Washington, D.C.: GPO, July 21, 1943.

USAAF XII Tactical Air Command HQ. *XII Tactical Air Command Tactical Operations: A Report on Phase 3 Operations of the XII Tactical Air Command for Army Air Forces Evaluation Board European Theater of Operations.* XII TAC HO, 18 April 1945. Copy in the MHI library.

Wolfert, Michael L. "From Acts to Cobra: Evolution of Close Air Support Doctrine in World War Two." USAF Air Command and Staff College Student Report #88–2800. Maxwell AFB, Ala.: ACSC, April 1988.